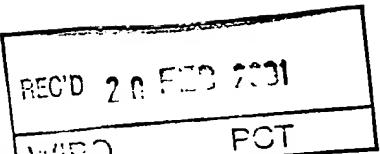


**PATENT COOPERATION TREATY  
PCT  
INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference <b>2220344/AXD/PSP</b>	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. <b>PCT/AU99/00845</b>	International Filing Date (day/month/year) <b>1 October 1999</b>	Priority Date (day/month/year) <b>1 October 1998</b>
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl. 7 C08C 19/00; C08J 11/04, 11/26</b>		
Applicant <b>ADVANCED PROJECT GROUP PTY. LTD. et al</b>		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 1 sheet(s).</p>																
<p>3. This report contains indications relating to the following items:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: left; padding: 2px;">I</td> <td style="width: 90%; padding: 2px;"><input checked="" type="checkbox"/> Basis of the report</td> </tr> <tr> <td style="text-align: left; padding: 2px;">II</td> <td style="padding: 2px;"><input type="checkbox"/> Priority</td> </tr> <tr> <td style="text-align: left; padding: 2px;">III</td> <td style="padding: 2px;"><input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: left; padding: 2px;">IV</td> <td style="padding: 2px;"><input type="checkbox"/> Lack of unity of invention</td> </tr> <tr> <td style="text-align: left; padding: 2px;">V</td> <td style="padding: 2px;"><input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: left; padding: 2px;">VI</td> <td style="padding: 2px;"><input type="checkbox"/> Certain documents cited</td> </tr> <tr> <td style="text-align: left; padding: 2px;">VII</td> <td style="padding: 2px;"><input type="checkbox"/> Certain defects in the international application</td> </tr> <tr> <td style="text-align: left; padding: 2px;">VIII</td> <td style="padding: 2px;"><input checked="" type="checkbox"/> Certain observations on the international application</td> </tr> </table>	I	<input checked="" type="checkbox"/> Basis of the report	II	<input type="checkbox"/> Priority	III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	IV	<input type="checkbox"/> Lack of unity of invention	V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	VI	<input type="checkbox"/> Certain documents cited	VII	<input type="checkbox"/> Certain defects in the international application	VIII	<input checked="" type="checkbox"/> Certain observations on the international application
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VIII	<input checked="" type="checkbox"/> Certain observations on the international application															

Date of submission of the demand <b>1 May 2000</b>	Date of completion of the report <b>31 January 2001</b>
Name and mailing address of the IPEA/AU <b>AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929</b>	Authorized Officer <b>B CROUCH</b> Telephone No. (02) 6283 2060

## I. Basis of the report

1. With regard to the elements of the international application:\*

the international application as originally filed.

the description, pages **1-8, ABSTRACT** as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of

the claims, pages **10-11** , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages 9 , received on **30 JANUARY 2001** with the letter of **30 JANUARY 2001**

the drawings, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of

the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language which is:

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

the language of publication of the international application (under Rule 48.3(b)).

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4.  The amendments have resulted in the cancellation of:

the description,        pages

the claims,            Nos.

the drawings,        sheets/fig.

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims 1-23	YES
	Claims 24-30	NO
Inventive step (IS)	Claims 1-23	YES
	Claims 24-30	NO
Industrial applicability (IA)	Claims 1-30	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

**NOVELTY (N): CLAIMS 1-30**

(a) DERWENT WPAT ONLINE ABSTRACT NO. 91-084541/12 JP 03 031 335 A (NIPPON ZEON KK) discloses a rubber composition produced by blending polyisoprene rubber; a fatty acid and/or fatty acid salt; metal salts of dithiocarbamic acid and; sulphur. Vulcanised rubber products are produced.

See abstract.

This document does not disclose the matter of claims 1-30.

(b) DERWENT WPAT ONLINE ABSTRACT NO. 90-083087/11 US 4 895 911 A (GOODYEAR TIRE AND RUBBER) discloses enhancing the cure of vulcanisable rubber elastomer with a tall oil fatty acid mixture. The tall oil fatty acids comprising oleic acid, linoleic acid, conjugated linoleic acid, rosin acids, optionally stearic acid, and at least one other selected acid.

See abstract.

This document does not disclose the matter of claims 1-30.

(c) DERWENT WPAT ONLINE ABSTRACT NO. 42239C/24 JP 55 058 234 A (BRIDGESTONE TIRE KK) discloses vulcanisable rubber compositions comprising rubber; sulphur; vulcanisation accelerators; alkali soaps and zinc white. The vulcanisation accelerators and zinc white are common additives in the art of treating vulcanised rubber.

See abstract.

This document discloses the matter of claims 24, 28-30.

(d) DERWENT WPAT ONLINE ABSTRACT NO. 87-043441 JP 62-43441 A (RIKEN VITAMIN CO LTD) discloses a rubber compounded composition obtained by adding a thermal reaction product of a polyhydric alcohol ester of an unsaturated fatty acid with sulfur to rubber.

See abstract.

This document discloses the matter of claims 24-30.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**1. Claim 24 is not fully supported by the description.**

The description states treating involves a specified method. The blending of 'the solution' with particulate vulcanized rubber; and heating the blend for a time period and at a sufficient temperature and pressure to substantially devulcanize the rubber.

See page 2

Perhaps claim 24 may be better defined if it were suitably appended to the method of claim 1.

**2. The description is not clear.**

The description states the treatment solution consists of sulphur and a fatty acid or ester or a salt thereof. However the only disclosure of a fatty acid or ester or a salt thereof envisaged by the description is "oleic acid".

The description appears to be speculative in stating other types of fatty acid or ester or a salt thereof are applicable to the present invention.

See pages 1-8.

Perhaps claims 1 and 24 should define "oleic acid" as an essential feature.

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

**Continuation of Box V**

No individual citation or obvious combination of citations (a) - (b) disclose the method of claims 1-23 or the solution of claims 24-30.

**INVENTIVE STEP (IS): CLAIMS 1-30****AS ABOVE.**

- 9 -

## CLAIMS

1. A method for the treatment of vulcanized rubber comprising the steps of: providing a solution of sulfur in a fatty acid or ester or a salt thereof; blending the solution with particulate vulcanized rubber; and heating the blend for a time period and at a sufficient temperature and pressure to substantially devulcanize the rubber.
2. A method according to claim 1, wherein an oil-base softening agent is added to the blend prior to heating of the blend to soften the rubber during treatment.
3. A method according to claim 2, wherein the softening agent is an aromatic oil.
4. A method according to claim 1, wherein, during blending of the vulcanized rubber with the solution, the blend is cooled.
5. A method according to claim 4, wherein the blend is cooled by water cooling a mixing vessel in which the vulcanized rubber and the solution are being blended.
6. A method according to claim 1, wherein the blend is heated for a time period of from about 1 hour to about 8 hours.
7. A method according to claim 6, wherein the blend is heated for a time period of from about 4 to about 8 hours.
8. A method according to claim 1, wherein the blend is heated at a temperature of from about 180°C to about 200°C.
9. A method according to claim 1, wherein the treatment is carried out at a pressure of from about 18 to about 20 kg/cm<sup>2</sup>.
10. A method according to claim 1, wherein the blend comprise about 100 parts particulate rubber, 4 to 6 parts softening agent and 2 to 4 parts treatment solution.
11. A method according to claim 1, wherein the particulate rubber is rubber crumb having a particle size of less than 6mm.
12. A method according to claim 1, wherein the particulate rubber is powdered rubber.
13. A method according to claim 1, wherein the solution of sulfur and fatty acid or ester or salt thereof comprises a solution of sulfur and fatty acid or ester or salt thereof in a ratio of 1:4.